University of Toronto
Department of Electrical and Computer Engineering

ECE241F: Digital Systems
Fall 1996

Hardware Lab Project

The Task

This lab is intended to allow you to express your creativity in the use of what you have learned for this course.

You are to design and implement a 3-week project of your own choosing that uses digital logic in some creative way. You may use any of the parts available in the lab, with a limit of three PALs per group (the ones you bought). An important part of this lab is the creativity required to think up an interesting project, and then negotiate with a TA or instructor as to the final form of the project.

Before the first project lab, you should hand in a one-page *project proposal* of what your project is about. This should be a short description that gives:

- The basic idea of the project, and the basic function of your circuit.
- describe the inputs and outputs, and give a simple block diagrams describing how the various parts of your circuit interact.
- your plan of action for each of the three lab periods - "milestones"

Present this to a TA or instructor to get their opinion on whether the project is viable. Once approved, you should get their signature. This is just a check to make sure that you do not try something overly ambitious.

At the first project lab, you **must** be prepared to begin implementing your project. Your marks for the first lab period will be based on the level of preparation you have done – you must have circuits and schematics ready to be built.

In order to make a multi-week project work, you must have your own proto board and PALs. For this reason, we have arranged to have the kits mostly used in ECE 231 (next term) available for purchase this term. In addition, the kits now include 3 PALs for the purposes of this project. If your group has not yet purchased this kit, please do so now.

You will be required to hand in a written report describing your project, which is due **Tuesday December 3rd, at 5pm in Room Pratt 484** This should be no more than five pages, and should include the the following sections:

- Introduction/Motivation - what you're doing and why.
- A description of the design, in both illustrations (block diagram) and words. This should be a well-written easy-to-read document!
- A description of the working/not working status of the project. If it did not work, indicate the reasons why you think it didn't work.
- Indicate what you would do differently if your were to start the project over again. What did you learn?

Grading

This lab accounts for 10% of your overall grade. This will be a total of 35 marks broken down in the following way:

Progress/1st Lab Prep in each of the 3 lab project periods, a mark out of 5. The mark for the first period will be based on the quality of the preparation - you must come with one periods worth of work to do in the lab, using the lab facilities. You shouldn't be doing design work here, but implementation.

Report/Technical Quality A grade out of 10 on how good your design is. Did you choose a reasonable implementation or did you come up with a complicated solution? Have you taken a good design approach, considering partitioning and hierarchy? How well does it work?

Report/Writing Quality A grade out of 10 on the quality of the written document. In industry, good technical work usually goes un-noticed unless it is documented well.